

[Detailed Description of the Invention]

[0001]

[Field of the Invention]The information which the area which carries this invention by a small light weight called a moving terminal, and in which that moving terminal carries out the whereabouts to an easy computer system and this moving terminal, and a moving terminal expect service is related, Or information which has strong correlation is related with the information service method, information service system, and moving terminal to a moving terminal at the time of an information provider providing suitable servicing information according to the position of a moving terminal.

[0002]

[Description of the Prior Art]By using the information about the position of a moving terminal, the invention which provides the fine service which was excellent in convenience to the user of a moving terminal is put up for JP,5-102906,A by a name called a mobile communication system. The user who can know a self-position with a car-navigation system connects the information about a self-position to a service center by a car telephone, and this invention downloads the congestion information and the newest map information about a self-position from there. The area where a user exists by the position of the base station of a car telephone even if it does not get position information from a user specially is presumed, and the invention of downloading servicing information, such as congestion information about the area, is also indicated.

[0003]

[Problem(s) to be Solved by the Invention]In order that the above-mentioned conventional technology may know the newest right-of-way situations by road repairing etc., such as road interruption and the Shinji line opening of traffic, when the newest map data is obtained, The data transfer rate by a car telephone is as slow as about 2.4k bps, since map data is compressed and becomes the data volume of several 10 or more kByte in addition to it, it will run several kilometers only by the air time of the searched map data, and information required for real time is not acquired. It is difficult to receive required information from the quality being bad and the wireless transfer by a car telephone tending to generate a bit error actually, and it being necessary to resend, since it is the guarantee in real time.

[0004]Since the information of K traffic congestion [ what ] in the road there is given by invention where of the user position neighborhood according to the inquiry from a user conventionally [ above-mentioned ], If the user does not have the knowledge about the road which is congested easily beforehand, there is a user in acquiring the information how much time is required after the timing to ask will not be known, but being involved in traffic congestion so and involved in traffic congestion until traffic congestion is solved. However, the user should want to know whether it can arrive at the destination most in a short time, when

traffic congestion has occurred on the course to the destination rather than how much time it takes after being involved in traffic congestion before [ the dissolution ], and getting to know and what kind of course is chosen.

[0005]Then, the purpose of this invention is to provide the suitable moving terminal for the correspondence procedure and this which can provide real time with the information provided to a user.

[0006]Other purposes of this invention are to provide the suitable moving terminal for the correspondence procedure and this which transmit the information provided to a user to a user to suitable timing.

[0007]

[Means for Solving the Problem]To achieve the above objects, this invention was constituted so that loading of the servicing information might be beforehand carried out to a moving terminal. An information server specifically connected with a moving terminal and a database, A system which has a network connected to this information server, and a terminal which is connected to this network and provides said information server with a variety of information, If it is an information service method from said information server to said moving terminal, said moving terminal is connected to said network and information on a present location of this moving terminal and a destination is inputted into said moving terminal, Said information server which notified information on a present location inputted into said information server, and a destination via said network, and received a notice of information on said present location and a destination from said moving terminal, Via said network, determine whole area including said present location and a destination, transmit servicing information including position information corresponding to whole this area to said moving terminal, and said moving terminal, After storing said servicing information including position information corresponding to said received whole area in a storage parts store and completing this storing, connection with said network is cut and it was made to output said servicing information stored beforehand according to a user's demand.

[0008]An information server with which this invention was connected with a moving terminal and a database, A system which has a network connected to this information server, and a terminal which is connected to this network and provides said information server with a variety of information, From said information server, are an information service method to said moving terminal, and said moving terminal, Are connected to a cellular phone in order to be connected to said network, and it is periodically connected to a GPS device stored in a memory, and a self-position Its present location information from this GPS device, If information on a destination that it was inputted is inputted, information on a present location inputted into said information server and a destination will be notified via said network, Said information server which received a notice of information on said present location and a destination from said

moving terminal, Via said network, determine whole area including said present location and a destination, transmit servicing information including position information corresponding to whole this area to said moving terminal, and said moving terminal, After storing said servicing information including position information corresponding to said received whole area in a storage parts store and completing this storing, connection with said network is cut and it was made to output said servicing information stored beforehand according to a user's demand.

[0009]In an information service method to the above-mentioned moving terminal, said moving terminal transmits its present location information to said information server periodically via said network, and, as for this invention, said information server transmitted servicing information to said moving terminal via said network periodically.

[0010]Said information server with which this invention received said its present location information from said moving terminal in an information service method to the above-mentioned moving terminal performs comparison with servicing information of area previously transmitted to said moving terminal, and servicing information of area which it is going to transmit this time, When servicing information of area which it is going to transmit this time differed from servicing information transmitted last time, servicing information of area new to said moving terminal was transmitted to said moving terminal via said network.

[0011]In an information service method to the above-mentioned moving terminal, this invention creates hysteresis information because said moving terminal stores information on a self-position periodically, judging the next area from created this hysteresis information, and notifying the next area to said information server via said network -- this -- servicing information of the next area was asked.

[0012]This invention stores in an external memory part of said moving terminal servicing information of whole area which includes said present location transmitted from said information server, and a destination in an information service method to the above-mentioned moving terminal as compressed data, when servicing information of said judged next area is not stored in RAM of said moving terminal, after reading servicing information of the following area stored in said external memory part and doing defrosting work of servicing information which carried out this reading appearance, it was made to store in RAM of said moving terminal

[0013]

[Embodiment of the Invention]The example of 1 composition of the hardware item of the moving terminal in this system is shown in drawing 2.

[0014]Have the moving terminal 20 and CPU(Central Processing Unit) 10 this CPU, It communicates with RAM (Random Access Memory)12 and ROM (ReadOnly Memory)11 which are main memory units via the system bath 50, It communicates also with the liquid crystal panel input-output control unit 14, the card adapter 15, and the modem unit 16 which

are circumference input/output devices. The bus controller 13 controls the communication between the circumference input/output devices relevant to CPU10. The panel 16 which is a display and is an input device from the pen 17 connects with the point of the liquid crystal panel input-output control unit 14. The removable memory card 18 which is an external storage connects with the point of the card adapter 15. A telephone line can be connected to the point of the modem unit 16, and, thereby, the moving terminal 20 can communicate with the computer system of a remote place.

[0015]Drawing 3 is a block diagram showing the example of composition of this system. 21 is an information server and connects with the database 22. Although the information server 21 is the computer as the moving terminal 20 with the same fundamental composition, the capacity of memory storage differs from the input-output control unit with the database 22. 23 is a servicing information donor of 21 in an information server, and is various shops, such as a restaurant and a convenience store, here. 24 is a traffic information center which grasps the current state of a road. the moving terminal 20 passes the public network 25 -- above each -- it is connected to the device. The information server 21 acquires servicing information [ as opposed to users, such as map information from the shop 23, and merchandise information, for road congestion information ] from the traffic information center 24 again, and stores it in the database 22.

[0016]Drawing 4 is a figure showing the example of the data format in the database 22. The servicing information in texts, such as servicing information with a sound which reads out the servicing information and map guidance by a picture [ like a road map ] whose servicing information in this invention is, and a message indicator of shop guidance, corresponds. Anyway, if it is the method of memorizing the data coded irrespective of the types of said servicing information in the database 22, it is memorizable by the servicing information in any service arrangements. The information which identifies the classification of servicing information which carried out point \*\* is described by the types of services in drawing 4. The search key information provided in the search key part by position information in order to make search of area easy is described. And the information which shows the storing position and range of data in the database 22 is described by the address part.

[0017]in addition -- using drawing 5 -- \*\*\*\* of the search key of each data of the database 22, and servicing information -- it \*\*\*\*\* just. Corresponding to the position on a map, it divides for every area, and this is named. for example, the present location of a moving terminal -- e-B area and naming \*\*\*\*\*. Matching with position information and area is made by having a mapping table for pinpointing area applicable from the position information on a moving terminal. This area name is memorized by the search key part.

[0018]Now, next, one sequence in case the moving terminal 10 receives the information service by this invention is shown in drawing 1.

[0019]A user assumes the case which goes out for a drive. First, when a user selects the course to the destination before a start, the newest information wants to have come to get to know what has happened to the intermediate road state (S100). The moving terminal 10 is connected to a telephone wire, and a road state inquiry program is started using this. Under the present circumstances, present address and the target address are inputted according to directions of a program (S102). The started inquiry program telephones the information server 21 using a telephone line, and the connection which is a logical channel for data communications is established between the moving terminal 10 and the information server 21 (S104). Next, the moving terminal 10 notifies the position information on the present location inputted by the user and the destination to the information server 21 (S106). The information server 21 which received said position information determines the area of a its present location, and the area of the destination, as drawing 5 showed. And the range of retrieving area is determined. Supposing a its present location is [ the e-B area destination ] b-E area as it is this example, as for the retrieving area range, the area of the range where a their present location and the destination serve as a vertex of the rectangle will correspond to e-B, e-C, e-D, e-E, d-B, d-C, and flume \*\*\*\*\*. Data including servicing information applicable from a database by using these area as a search key is searched (S108). Next, the taken-out servicing information is transmitted to a moving terminal (S110).

[0020]The format of the send data from an information server to the moving terminal at this time is shown in drawing 6. This format is the form that the data for which the header information for controlling a communications protocol took lessons from the head and which was searched from the database below continues. However, the position (range) information on area that the servicing information concerned is related instead of a search key is sent. The moving terminal which received this is made into the form which can be searched according to the position information on servicing information, and memorizes this to a memory card (S112). A connection is cut after the data transfer of servicing information is completed (S114). The user notified of what download of servicing information was completed by an inquiry program, and the connection cut separates a moving terminal from a circuit, carries this, and leaves towards the destination (S116).

[0021]When the situation about a point wants to have come to get to know during movement on the way, required information, including congestion information etc., is referred to by searching the servicing information downloaded beforehand (S118).

[0022]Drawing 7 shows one example of the servicing information reference screen of the moving terminal 20. This screen comprises various kinds of windows described below. The whole map window 701 is explained first. This displays all the area where the downloaded servicing information is related, and the outline map is displayed. And it is blocked for every constant distance and a present location (this example departure point) and the destination are

shown in that block. And the block currently displayed in the detailed map window 702 described henceforth is discriminable. The detailed map window 702 is a window which displays the detailed map of the block selected in the whole map window 701. Traffic informations, such as a course to the destination and traffic congestion, are laid on top of a map, and are displayed graphically. The message window 703 is a window which displays the text-ized servicing information. The menu window 704 is a window which displays the control icon and search information icon of a servicing information retrieval program which are the programs of this moving terminal 20. A control icon images directions of performing a start and end of this program by selecting these icons.

[0023]A search information icon, for example A gas station, a restaurant, a motor pool, If a rest station, a drive-in, etc. are made into the icon, respectively and choose this, the pertinent information (a position, a price, the feature, etc.) will be displayed on the detailed map window 702 as image data, and text data will be displayed on the message window 703. When pertinent information is voice data, a speech output unit is connected to the moving terminal 20, and the voice data of pertinent information may be transmitted to a user as an announcement by icon selection.

[0024]In order according to the above-mentioned example to carry out loading of the servicing information to the moving terminal 20 in a departure point before leaving for the destination, it is suitable, when the case, comparatively short distance [ the destination ], and the destination were decided beforehand and the change does not exist. That is, by the time even the destination arrives distantly, in the case where time is long. It says [ that it may have been no longer the information which servicing information, such as congestion information which carried out loading beforehand, became old, and was based on the actual condition on that occasion ], In the case where the original destination is changed according to a situation, that servicing information, such as congestion information to the destination which carried out loading beforehand, stops being useful arises. In such a case. When fixed time, constant distance, or the destination is changed, the fault of the previous method is cancelable by the method of dropping in at a public telephone with the terminal for nearby data communications, accessing the information server 21 again, and downloading the newest or the changed servicing information to the destination. Of course, the position of a public telephone needs to be contained in servicing information, and it is important that the user enables it to refer to this.

[0025]Hereafter, the example which is not restricted to a fixed access position by a wireless communication means is described after this.

[0026]Drawing 8 is a system configuration example. It is a car telephone, and it is connected to the moving terminal 20 and 30 is an agency device of the data communications of the information server 21 and the moving terminal 20. It is a GPS (global positioning system)

device, and is connected to the moving terminal 20, and 40 has the function to deduce a self-position with high degree of accuracy (error: several meters), by receiving the radio wave signal from two or more artificial health. GPS device 40 deduces a self-position periodically, holds this in the memory, and passes the self-position memorized according to the demand from the moving terminal 20. At this time, a self-position is notified to the moving terminal 20 by making longitude and latitude into position information.

[0027]Drawing 9 is a download sequence of the servicing information at the time of changing the destination in the middle of the destination. It explains focusing on the difference from the sequence in drawing 1. A user needs the newest status information about the destination according to examples, such as change etc. of the destination shown previously (S200). After checking that the moving terminal 20 has connected with the car telephone 30, a road state inquiry program is started. Under the present circumstances, what is necessary is to input only the target address according to directions of a program unlike S102 (S202). S204 which establishes a connection differs in the point using wireless communications lines but like S104. S208 to S214 is completely the same as that of S108 to S114. However, since the moving terminal 20 passes the latitude and longitude to which the present position information was notified from GPS device 40 to the information server 21 as it is, mapping of area and latitude longitude can be performed and it can search the status information about applicable area with the information server 21. S216 which refers to the status information of a point on the way corresponds with S114 during movement, and a series of sequences are ended by this.

[0028]Next, the status information which became old is left and the example which carries out loading of the newest information to the moving terminal 20 automatically for every fixed time is shown below.

[0029]Drawing 10 is a sequence which downloads the status information which the moving terminal 20 asks and needs for the information server 21 periodically. This is also explained centering on a place which is different by contrast with drawing 9 similarly.

[0030]S304 is the same as that of the sequence S200 of drawing 9 to S204 from the sequence S300 until it notifies the position information on the present location of the moving terminal 20, and the destination to the information server 21 from the moving terminal 20. The information server 21 judges in which area the moving terminal 20 is located from the position information on the moving terminal 20, and memorizes the area in which the moving terminal 20 is located as hysteresis information. And it is judged whether area when position information is notified the area in which the moving terminal 20 carries out a current position, and last time is compared, and it is in agreement (S308). When said decision result is in agreement, it judges that it is present in the same area, and it shifts to connection cutting (S314) without searching status information. When saying that the movement speed that this has a change of a situation looser than an inquiry time interval, and it is left with the moving terminal 20 standing still does

not become slow unusually from usual, it is the function provided in order to exclude the futility which downloads the same status information. It returns to the sequence S308 and explanation is continued. When this decision result is not in agreement, it judges that it moved to the next area, status information is downloaded below, and a sequence (from S310 to S316) until it refers to this is performed. This is the same as that of the sequence S208 in [drawing 9](#) to S216. The sequence S318 is a judgment sequence of a re-inquiry. That is, if there is no terminating request from a user waiting and in the meantime until it starts a timer and reaches a fixed count, it will move to the sequence S304, and if a terminating request occurs, it will move to the processing ending sequence S320. Although an example of the function provided in order to exclude the futility which downloads the same status information in S308 was shown, The history of the information downloaded to the moving terminal 20 to the information server 21 can be managed, and the example realized by downloading only the information which has not yet been downloaded according to the inquiry from the moving terminal 20 can also be easily included in the above-mentioned sequence.

[0031] Now, when the information which had carried out loading beforehand became old in a whereas clause and the newest information was needed, the moving terminal 20 described that it carried out for every constant distance as an opportunity which accesses the information server 21, but. Mere not distance but terrestrial position from a starting point are blocked for every area of a certain as the example of realization, it moves to the next from the present area in the area through which it passes even to the destination by making into starting point area area including a starting point -- I will come out -- area is made into the following area and the example which carries out loading of the status information of the following area contiguous to this present area automatically one after another is explained using [drawing 11](#). [0032] It explains focusing on the difference between [drawing 11](#) and [drawing 10](#). The sequence S400 until it starts an inquiry program to S402 is the same. Next, it is confirmed whether, in [drawing 11](#), the status information about the following area which deduced the present area from the present position information, and was explained previously has already downloaded the moving terminal 20. Case [downloaded], it already moves to the end decision sequence S418. When that is not right (i.e., when the status information about the following area has not downloaded), the position information on the following area is notified (S408). This position information is the range of latitude longitude. The information server 21 which received this searches the status information of the appointed area from a database, and transmits an applicable thing to the moving terminal 20. Thus, the moving terminal 20 memorizes the status information about the following area sent from the information server 21 (S412). Next, connection cutting is performed (S414) and reference of the status information about the following area is attained (S416). The next is the end decision sequence S418, this is the same as that of S318 of [drawing 10](#), if there is no terminating request into a prescribed



period, it will move to S404 and the existence of the status information about the following area will be judged from present position information. Also in this sequence, the status information about the following area may become old in the case where a moving terminal stands it still. However, for example, when dropping in at a restaurant etc., a user is a deed about the end of this program. It will be satisfactory, if the operation form of having this program started is used when leaving again. The moving terminal 20 attaches the term of validity to the status information downloaded from the information server 21, and to that in which this term expired, even if it does not move to the following area, it can download the status information newest because it is made to ask periodically to the information server 21.

[0033]Although the following area in the above-mentioned example was explanation that it was the area contiguous to the present area, As the paragraph of Object of the Invention described, in order for the position related information to be meaningful in download of the position related information in a mobile, the relation described below must be filled and, as for the following area described previously, the relation must be filled.

[0034]Drawing 12 is a figure explaining the relation between the quantity of the data about the movement speed, the data transfer rate, and a certain area that should be downloaded of a moving terminal. First, the juniper into which it thinks on the basis of the starting point, and the area a, the area b, and the area c and area are divided from there. In order to simplify explanation, the size of each area shall be constant and it shall be a square of length (l m), and the data volume of the information relevant to each area shall be constant, and shall have the data volume of D (K byte). And when a data transfer rate is set to TR (K byte/s) and speed of a moving terminal is V Carried out (m/s), the time T required for loading the pertinent information on one area is D/TR. The distance L which is set to (s) and a moving terminal moves between them is  $L = V \cdot D / TR$ . It is set to (m). Temporarily, this L must choose the area c as following area in the starting point of drawing 12, when [ than l / larger ] smaller than  $2 \cdot l$ . That is, the conditions to which the n-th area corresponds are expressed as  $V \cdot D / (TR \cdot l) - 1 < n < V \cdot D / (TR \cdot l)$ .

[0035]The following area can be determined by making CPU of a moving terminal solve this conditional expression. When using it, installing the moving terminal 20 in a car, the interfacing unit which notifies the present speed to the moving terminal 20 from a speed measuring instrument can be formed, and speed can be found from there. It may ask for movement speed from the migration length after fixed time using a GPS device. Other parameters are given as an initial condition.

[0036]The above example showed the example which downloads a position or the servicing information relevant to area from the information server 21 located in the remote place connected via the public network.

[0037]As the technical problem showed, servicing information is the art it enables it to search immediately from a user, and the art used as the core of this invention has the feature in

making not visible from a user time which download takes in a previous example. Then, even if the storage place of servicing information is a disk unit of the moving terminal 20 built-in instead of a remote, The data compression of the servicing information stored in the disk unit is carried out, when the thawing treatment time is large, this is made not visible from a user and the information on applicable area explains after this the example which can be immediately searched from a users request.

[0038]Drawing 13 is a figure explaining the matter about the servicing information memorized by RAM12 and the memory card 18.

[0039]First, the servicing information of each compressed types of services of area each, is saved at the memory card 18 by the name compressed data n (n natural number;1, 2, 3, 4 ....). The directory information which is the matching information of the servicing information name of each compressed types of services of area each, and the address in the memorized memory card 18 is also stored. compressed data -- the type (a text, a picture, and a sound) of each data -- the data compression rate is independently compressed by various kinds of compression algorithms used as the highest.

[0040]The thawed servicing information (the present area information) about the present area and the thawed servicing information (the following area information) about the following area are memorized by RAM12, and area and the compressed data name conversion table 130 are also memorized. This area and compressed data name conversion table 130 comprise each of next fields. The area name field is a name of each area, and is described in the example of drawing 5 by sign called a-A. The types-of-services field is the field showing the classification of each servicing information. The compressed data name field makes the servicing information field and a pair, and the name of corresponding compressed data is described.

[0041]Next, the chart of CPU10 in this example and each related element of operation is explained using drawing 14. Drawing 14 is the chart of operation which showed the timing of the servicing information search and CPU processing by the position and user of a moving terminal, and compressed data loading between disk RAM. Analogy with drawing 11 explains drawing 14. A moving terminal corresponds to CPU and the information server supports the disk, respectively. The existence judging S404 of the status information about the following area corresponds to a detecting position (1100) and the following area judging (1102), The notice S408 of position information of the following area caters to a data load request (1104), Status information search and the transmission S410 of the appointed area correspond to waiting time (1106) and a data load (1108), The status information memory S412 of the following area corresponds to an end report (1110), and referring to the status information S416 is equivalent to retrieval required (1114), retrieval processing (1116), and a search response (1118). There is nothing corresponding to thawing treatment (1112). From now on, this chart will be explained for order later on. The charts from 1100 to 1112 are periodically

repeated by the timer function explained by S418.

[0042]First, in 1100, it is distinguished by the position information from GPS device 40 in which area the moving terminal exists. In 1102, the following area is judged and it is confirmed whether the servicing information (the following area information) about the following area is stored in RAM12. When the following area information is not stored, all the compressed data names about the following area perform a data load request from the table 130 to the disk unit of memory card 19 grade (1104). Comparatively long time after that in which a disk unit has a rotation system and the waiting time 1106 has an auto-power-off function for power saving, for example receives a demand until rotation of a disk is stabilized turns into the waiting time. Compressed data is arranged by the data load 1108 in the free area on RAM12. CPU10 which received the end report 1110 from a disk thaws each compressed data arranged on the memory of RAM12 grade, and when it exists in the present area, the following area information is restored (1112). The format of the present area information and the following area information is shown in drawing 16. This comprises a pair of the area information, the types of services, and the servicing information main part which describe related area.

[0043]When it detects having shifted to the following area in the position detecting function with movement of a moving terminal, the present area information is released and processing which makes the following area information the present area information is performed. This is for using effectively the storage area of RAM12 with few storage capacities. Thus, let the following area information developed on RAM12 in the former present area be the present area information. The retrieval required of the servicing information concerning [ the retrieval required from a user ] the present area comes (1114). Service information applicable considering the types of services shown by drawing 16 as a key is searched (1116). And applicable service information is answered to a user (1118).

[0044]The above-mentioned example is an example in which compressed data is contained in the disk. As drawing 9 explained, the example in the case where have the status information about two or more area to the destination sent in the form by which the data compression was carried out from the information server 21, and this is beforehand memorized in the memory card 19 was shown, but. Information, including positions, such as a map, a shop, etc. used as the base which seldom changes, etc., is memorized in the form compressed into a storage like CD-ROM, Information, including the intense road state of change, a merchandise price, etc., is downloaded by a communication line from a remote information server, and the gestalt provided as multimedia information, such as a sound, a text, and a picture, can also be guessed easily.

[0045]If a data compression rate is generally high with the case which downloads compressed data from an information server, in order that the defrosting time may also have this relation and may so lower communication cost, when the high method of a data compression rate is

chosen, If the thawing treatment time of the compressed data is a size which cannot be disregarded compared with data transfer time, the deciding method of the following area explained using drawing 12 must be changed. What is necessary is just to determine it from the formula which added the defrosting time of compressed data to the time T in drawing 12.

[0046]For search time shortening of the data which memorizes the information about the position of area etc. in the form of compressed data to CD-ROM etc. as shown in the upper example, and is searched in the following area, Probably, it understands easily, even if it does not describe the deciding method of the following area in detail, either, in order to load and thaw the data about the following area in the present area.

[0047]What is necessary is just to approximate the time T with the sum of waiting time and thawing treatment time. A portable CD-ROM drive device in particular is indispensable at a thin and light power-saving type, therefore maximum torque of the motor part is not made greatly, moment of inertia of CD cannot fully be driven, but latency speed becomes large. Incidentally, auto-power-off logic is explained using drawing 15. This logic is started when disk access processing is completed. First, the zero clear of the timer counter is carried out (1000), and the existence of a disk access request is checked (1002). If there is an access request, this processing will be ended and it will shift to disk access processing. By the judgment in 1002, when there is no access request, it is judged whether the count of the timer counter became beyond default value (1004). If it is beyond default value, power of a motor is turned OFF, and rotation is stopped (1006). If it is not beyond default value, constant time waiting (1008) and a timer count will be made to increase (1010), and it will shift to 1002.

[0048]The above example was an example which was adapted for the navigation system by making this invention into typical application. the gestalt which uses a moving terminal as shopping catalog reference apparatus -- that is, Consumers carry this moving terminal into a department store, a shopping town, an underground center shopping center, etc., the merchandise information about pleasing goods is pulled out from the merchandise data base of an information server via a moving terminal, and the example in the gestalt made the reference on merchandise purchase is described after this.

[0049]The radio accessing means in such an example is realized by PHS (Personal Handyphone Sysytem), for example. Therefore, a cordless telephone is connected instead of car telephone 30 of drawing 8. The detecting position of a moving terminal judges the position of a moving terminal nearby from the radio field intensity of a cordless telephone in the base station of PHS arranged within the enclosure. Therefore, in a moving terminal system, a position sensing device like GPS40 is unnecessary. The method by an active batch, etc. are known well, concerning such a detecting position mechanism. As point \*\* was carried out, it is a moving terminal device used in order to call it the merchandise information reference tool in the shop suburbs, and it is unsuitable to make the position information on the destination input

by a user, as the former example showed. That is because impulse buying cannot be supported. Since the instance reference nature of merchandise information is filled at this time, this invention can be adapted for the method which carries out loading of the information which will be referred to in the movement destination in the present area. Although the range (about prospect 100m) which one base station covers is called a cell, since the area described above to this cell is logical, those correspondences do not need to be 1 to 1. As mentioned above, when the destination is not given, all the area which adjoins the present area as following area is chosen, and the information relevant to these area is downloaded.

[0050] Drawing 17 a and 17b show the relation between the present area and adjacent area. In drawing 17 a, it is a figure in which having shown the development view of superficial area and showing that aA, aB, aC, bA, bC, cA, and cB.cC become that bB is the present area with the following area. Although two dimensions showed drawing 17 a, probably, two or more stories also understand easily the extension to three-dimensional area arrangement in the case which the shop is distributing. Since it is logical about the composition of area, the physical location of a actual cell does not need to be a short distance in a position. for example, when the upper part and the lower part are connected in the direct elevator, or when another construction crosses and it is connected at the passage, it comes out.

[0051] Correspondence of a cell and area does not need to be fixed and it may be made to change the correspondence according to the amount of information, as stated previously.

[0052] If area is made by turns like drawing 17 b, the number of the following area can be lessened. The amount of information made to download by this can be lessened. When the following area deciding method is followed, the area which does not adjoin the present area may turn into the following area.

[0053] In an upper example, if there is many following area, it may not fit in the memory of the moving terminal 20. It explains by the case where adjacent area is chosen as following area. In this case, the history of the types of services referred to in the adjacent area to the present area and its adjacent area is taken, and the method preferentially downloaded from what has many number of times of a history is adopted. This has the meaning of providing service preferentially to the customer. Drawing 18 shows a management table (180) for the information server 22 to realize this function. In the present area field, an area name is described. The name of the area where two or more adjacent area fields [ / this ] adjoin the present area is described. In the service type field, goods classification is described by the type of servicing information, and the concrete target. The reference frequency field is the field which describes the number of times which the user referred to. In this figure, although correspondence of each field is expressed by the block, in order to make retrieval processing high-speed, the thing using a hash table may be used, and it may be matched with tree form. Except for reference frequency, since these fields are static information, a value and information concrete at the

time of starting are described, and they are not updated frequently henceforth. About reference frequency, if a user refers to the information concerned, the moving terminal 10 will detect this and it will notify to the information server 21.

[0054]The information server 21 which received this raises reference frequency. The sequence between a moving terminal and an information server is the same as that of drawing 10.

However, it differs in that the information about positions, such as a destination of S306 and a its present location, is not given.

[0055]Although it was the example that the above determined the position control of the moving terminal 20, and the servicing information used as a loading object with the information server 21, the sequence which performs this by the moving terminal 20 side is explained using drawing 19.

[0056]The moving terminal 20 presupposes that the position information on the cell to which he belongs can be acquired by PHS service. The moving terminal 20 has matching information with the area which is a logical unit of the range about the position and servicing information of a cell, and, thereby, pinpoints the present area. And as the point was described, it asks for the adjacent area from the present area using the table 180 (S500). Next, the reference frequency in the table 180 in applicable area is seen, and servicing information with the large value is chosen (S502). The servicing information selected now is required of an information server by the service type (S504). The information server which received this searches the demanded servicing information from the database (S506). And search results are transmitted to a moving terminal (S508).

[0057]Although it was said in the above-mentioned example that it carries out for loading of the servicing information about all the area contiguous to the present area, It is an example which chooses the adjacent area on the extension from information and the present position information as following area, and carries out loading of the servicing information about this to the moving terminal 20 from a former position.

[0058]Drawing 21 is a figure explaining this idea, and, as for a former position and a flake, a sunspot expresses the present position. For example, when expressed as data on coordinates with these positions, a former position coordinate is lengthened from the present position coordinate, and direction data is obtained. It has a table showing the direction of the area which adjoins to the present area, and the adjacent area of an applicable direction is chosen as following area. Drawing 20 is an example of a sequence between the moving terminal 20 in this example, and the information server 21. First, the information server 21 performs a periodical position inquiry to the moving terminal 20 (S600). The moving terminal 20 which received this checks the justification of this message, a detecting position is performed and the detected position information is answered to the information server 21 side (S602). The information server 21 which received this judges the following area by the method which

carried out point \*\* (S604). This is transmitted if the servicing information about the judged following area is not transmitted to the moving terminal 20 side (S606).

[0059] Since the value of the timer was a fixed value not changing, its connection to the information server 21 was periodical, but starting a timer, in order to wait low time by S318 of drawing 10 explains the example which changes this according to movement speed. The related table of speed and the value of a timer is used and it memorizes in the moving terminal. The moving terminal which recognizes a its present location periodically by the position measurement function of GPS device 40 computes the movement speed of a moving terminal using the hour entry from the built-in clock, and memorizes movement speed average value. The average value of movement speed is reset applying a timer with this value in quest of the value of the timer which searches said table and corresponds with reference to that movement speed average value just before applying a timer. When it is in the state where the user has stopped at one place, by this, the frequency notified to the information server 21 can be lessened, and communication cost can be lowered.

[0060] Although assumption that the number of the access points to the information server 21 was one explained the above, an information provider may give two or more access points. At this time, the position of each access point is memorized to the moving terminal, and it understands the nearest access point by calculating and comparing the distance of the present location by GPS device 40, and each access point. From distance with the access point used now, telex rate gold becomes cheap by accessing the information server 21 with the number to be dialed of other access points with movement.

[0061] The case where two or more information servers 21 exist as other examples is also considered. Two or more access points will exist like the above also at this time. In the case where service industry companies with the information server 21 differ, respectively. In such a case that is not suitable for switching this automatically since service contents differ, respectively. The moving terminal 20 will be switched, if it checks to a user whether the information server 21 with which communication cost becomes cheap with movement is detected, and it changes with the service content of the information server 21 of cod roe and permit comes out.

[0062] Although the above showed the example which sends beforehand the \*\* servicing information which will be referred to in the form which answers the notice of the course information from the moving terminal 20 to the moving terminal from the information server 21, Next, when the situation of affecting the course of the moving terminal 20 occurs, the information server 21 detects this and one example of the sequence which transmits suitable servicing information to a moving terminal is explained using drawing 22.

[0063] The information server 21 is always monitoring generating of status information (S740). Since it is the same as that of explanation of other examples, the sequence (S700 to S708,

S728) which shows an information server position information periodically is omitted. The information server 21 which received position information presumes the course of a moving terminal based on the position information sent until now (S710). A course can be presumed, and a connection is released, without transmitting information to a moving terminal, when there is no servicing information applicable when it is not necessary to ask the information from a moving terminal any more (S712). Henceforth, the information server 21 monitors generating of status information, and if status information occurs, status information will take up all the affecting moving terminals, seeing the course estimation information created for every moving terminal. If there is nothing applicable, it will wait for the notice of the position information from the moving terminal 20 (S714). When there is an influenced moving terminal, the detour information for splitting, if it is the influence which should expect and avoid the influence is respectively created as servicing information. The sending timing of the servicing information concerned is scheduled, if it reaches at the time concerned, a connection will be established to the terminal concerned (S718), and the information on presentation is urgently added to the servicing information concerned, and it transmits to it (S718). Next, if transmission of servicing information is completed, a connection will be cut and it will prepare for the notice of position information (S720), or generating of status information. The moving terminal 20 which received the servicing information sent by doing in this way on the other hand presents the servicing information concerned to a user, seeing the information on the urgent presentation added to servicing information (S724). The user who received this service changes a course according to guidance of servicing information.

[0064]In each sequence explained above, when an inquiry program was started, the destination was inputted by the user, but below, the sequence which made the input unnecessary is explained.

[0065]the moving terminal 20 with a built-in GPS device is provided with a position information history control function, and has a system file which memorizes position information, and supply of power starts it -- having (S800) -- position information is periodically written in a system file (S801). A file provides the maximum of the position information to memorize, and if it reaches the maximum, it will use it from a head again. At this time, time is memorized with position information. an inquiry program starts -- having (S802) -- a moving terminal reads the position information in front of fixed time from a file, and notifies this to an information server (S806). This will be sent if the information server 21 which received this has the servicing information which should predict the course of the moving terminal 20 from the information, and should be sent (S808). A moving terminal notifies only a its present location periodically henceforth (S816, S806).

[0066]

[Effect of the Invention]According to this invention, the timely information according to the



situation which the user of a moving terminal needs on the spot can be retrieved immediately. When adapted for a car-navigation system and you would like to more specifically have come to carry out oil supply of gasoline during automobile operation, By displaying a nearby position, its maker, a price, etc. of a gas station on that spot, it is condition that suitable oil supply can be performed, and is got blocked with a user's judgment, and shopping under movement is comfortably made by providing convenient information for a user. Since it cannot be involved in traffic congestion or a short cut and a byroad can be used, there is also a merit that it can arrive at the destination promptly.

[0067]It is an example in the system configuration which does not make radio communication equipment or a position recognition device accompany a moving terminal, since said device of a moving terminal cannot be found according to this, cost can be held down that much, and it is effective in the ability to provide a cheap navigation system to a user. Since the means of communication used in order to download various servicing information described previously is a public telephone network, since it was quality, a lot of data for corresponding to multimedia could moreover be obtained cheaply in a short time, the public telephone network has spread nationally further and it is a telecom infrastructure -- the whole country -- there is also an advantage that it can be used anywhere.

[0068]When the vague time of the destination of the user using a navigation system not being become final and conclusive and the destination are far away, Even if it moves at what kind of speed, to at any time, the servicing information about the newest and the spot by a user's intention in order to be able to search immediately and to download servicing information, It is not necessary to move specially to a point with the fixed access point of a public line like a public telephone, and since the download is moreover performed automatically, there is an advantage of not troubling a user's hand. Since the download of the newest servicing information performed automatically (periodically) has prevented downloading downloaded information already again, it is effective in not paying communication cost excessive for download of useless information.

[0069]It has the effect that the information about the spot which likes battery power consumption and which was lost and was described above can be immediately retrieved with the system which can receive navigation service, by carrying a moving terminal also by not only for in-the-car registration but the time of a walk, or public transportation facility utilization time. And effect bubble \*\*\*\*\* which reduces communication cost by downloading only the intense servicing information of change from a remote information server, and storing in built-in memory storage the servicing information which is not intense as for change.

[0070]In the merchandise information reference system in a shopping center, the pertinent information about the goods which are pleasing at a glance can be referred to immediately on that spot, and it has the effect that memory quantity in a moving terminal can be lessened by

composition of logical area.

[0071]It has the effect that communication cost and a storage capacity are saved and the overhead in this processing can be saved, by filtering the information which should be downloaded using the information on the move direction.

[0072]In the composition which applied the remote work supporting system, since a worker can acquire the information about work [ in the work area ] and can start work simultaneously with work area arrival before he arrives at a work area with the moving terminal concerned, he has the effect that working efficiency improves. And only by downloading support information to a moving terminal by having provided the wire circuit which connects a command center to a work area monitoring instrument, since a command center is not connected with from a moving terminal using radio, the power consumption of a moving terminal can be saved.

[0073]Since the information about the route from which it should take refuge to a refuge person with a moving terminal in an escape guiding system can be given in detail by multimedia information, For example, it is avoidable that those who do not grasp the structure exactly with complicated buildings, such as an underground center, fall into a panic state, and since it can escape to a safe zone promptly, it has the effect that the human damage caused by disasters, such as a fire earthquake, can be suppressed to the minimum.

[0074]In a meeting reservation system, simultaneously with a visitor's arrival, the call to a conference room starts, and since information required for a meeting is distributed when it gathers, the waiting time to a meeting start is shortened, and it has the effect that a meeting can be started immediately. In this example, in order not to ask an information server a visitor's arrival, it is effective in abolishing and having a processing overhead about an inquiry and making battery power consumption into the minimum.

[0075]The storekeeper who is an information provider by transmitting the servicing information of time limit nature to a moving terminal spontaneously, A visitor can be drawn near to a self-store and it is effective in the ability of the user of a moving terminal to search immediately the store which provides the service which suited liking, a budget, etc. from this servicing information, and goods.

[0076]It avoids carrying out loading of the unsuitable information from the attribute of the user of a moving terminal to the moving terminal concerned, and is effective in avoiding reference of the unsuitable information by a user. By carrying out loading of the conversely suitable information to the moving terminal concerned, the user can refer to suitable information immediately according to the situation to timely.

[0077]When the program used in a certain area and the data to refer to have become settled, or when the correlation is large, the executive operation performance of the moving terminal provided with the virtual memory mechanism is raised, and comfortable computer environment can be provided to a user.

[0078]

[Effect of the Invention]According to this invention, the suitable moving terminal for the correspondence procedure and this which can provide real time with the information provided to a user can be provided.

[0079]According to this invention, the suitable moving terminal for the correspondence procedure and this which transmit the information provided to a user to a user to suitable timing can be provided.